

WHAT IS CLAIMED IS:

1. A method of stabilizing the wavelength of light emitted by each one of a plurality of multimode diode-lasers, each of said diode-lasers having an emitting bandwidth, the method comprising the steps of:

- 5 providing a wavelength selective reflecting device having a peak reflection wavelength within the emitting bandwidth of the diode-lasers;
- coupling the light emitted from the plurality of diode-lasers into a first multimode optical fiber;
- directing said light from said first multimode optical fiber onto said wavelength
- 10 selective reflecting device; and
- reflecting a portion said light having said peak reflection wavelength from said wavelength selective reflecting device back along said first multimode optical fiber and back into said diode-lasers thereby locking the wavelength of the light emitted from said diode-lasers to said peak reflection wavelength.

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2. The method of claim 1, wherein said wavelength selective reflective device is a FBG.

3. The method of claim 1, wherein said wavelength selective reflecting device is

20 a volume Bragg grating.

4. The method of claim 1, wherein said wavelength selective reflecting device has a bandwidth less than about 1 nanometer and a reflectivity between about 0.5% and

25 50%.

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5. The method of claim 1 further including the step of collimating said light from said first multimode optical fiber prior to said reflecting step.

6. The method of claim 1, wherein the light emitted from each of the plurality of diode-lasers is coupled into said first multimode optical fiber via a corresponding plurality of second multimode optical fibers.

5 7. A method of stabilizing the wavelength of light emitted by each one of a plurality of multimode diode-lasers, each of said diode-lasers having an emitting bandwidth, the method comprising the steps of:

coupling the light emitted from the plurality of diode-lasers into a first multimode optical fiber;

10 coupling said light from said multimode optical fiber into an optical fiber collimator, said optical fiber collimator including a fiber Bragg grating having a peak reflection wavelength within said emitting bandwidth; and

reflecting a portion of said light having said peak wavelength from said fiber Bragg grating back into said diode-lasers thereby locking the wavelength of the light
15 emitted from said diode-lasers to said peak reflection wavelength.

8. The method of claim 7, wherein said first multimode optical fiber has a first diameter and said optical fiber collimator has a diameter tapered at one end thereof from said first diameter to a second diameter greater than said first diameter, said first
20 diameter of said tapered region being coupled to said first multimode optical fiber.

9. The method of claim 8 wherein said optical fiber collimator has a straight region following said tapered region, said straight region of said optical fiber collimator having said second diameter and including said fiber Bragg grating.

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10. The method of claim 7, wherein the light emitted from each of the plurality of diode-lasers is coupled into said first multimode optical fiber via a corresponding plurality of second multimode optical fibers.

11. The method of claim 7, further including the steps of providing a single mode optical fiber including a single mode doped-core surrounded by a cladding, and coupling said light from said optical fiber collimator into said cladding of said single-mode optical fiber.

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12. A method of stabilizing the wavelength of light emitted from each of a plurality of multimode diode-lasers, each of said diode-lasers having an emitting bandwidth, the method comprising the steps of:

providing a plurality of first multimode optical fibers equal in number to the plurality of diode-lasers;

coupling the light emitted from each of the plurality of diode-lasers into a corresponding one of the multimode optical fibers;

coupling the light from the plurality of multimode fibers into a single second multimode optical fiber;

coupling the light from the second multimode optical fiber into an optical fiber collimator, said optical fiber collimator including a fiber Bragg grating having a peak reflection wavelength within said emitting bandwidth; and

reflecting a portion said light having said peak wavelength from said fiber Bragg grating back along said second and first optical fibers into said diode-lasers thereby locking the wavelength of the light emitted from said diode-lasers to said peak reflection wavelength.

13. The method of claim 12 wherein said optical fiber collimator has a straight region following said tapered region, said straight region of said optical fiber collimator having said second diameter and including said fiber Bragg grating.

14. The method of claim 12, further including the steps of providing a single mode optical fiber including a single mode doped-core surrounded by a cladding, and

coupling said light from said optical fiber collimator into said cladding of said single-mode optical fiber.

5 15. The method of claim 14, wherein said light is coupled from said optical fiber collimator into said cladding of said single-mode optical fiber via a third multimode optical fiber.

10 16. A method of stabilizing the wavelength of light emitted by each of a plurality of multimode diode-lasers, each of said diode-lasers having an emitting bandwidth, the method comprising the steps of:

 providing a wavelength selective reflecting device having a peak reflection wavelength within said emitting bandwidth;

 coupling the light emitted from the plurality of diode-lasers into a first multimode optical fiber;

15 emitting said light from said multimode optical fiber;

 collimating said light emitted from said multimode optical fiber; and

 reflecting a portion of said collimated light having said peak wavelength from wavelength selective reflecting device, via said collimating lens and said first multimode optical fiber, back into said diode-lasers, thereby locking the wavelength of
20 the light emitted from said diode-lasers to said peak reflection wavelength.

 17. The method of claim 16, wherein said wavelength selective reflecting device is a volume Bragg grating.

18. A laser, comprising:

a single-mode optical fiber having a single-mode doped core surrounded by a cladding, said doped core providing a gain-medium for the laser;

5 a plurality of diode-lasers, each of said diode-lasers emitting light having a wavelength within an emitting bandwidth;

a wavelength selective reflecting device having a peak reflection wavelength within the emitting bandwidth of the diode-lasers;

an optical arrangement for coupling the light emitted from the plurality of diode-lasers into a first multimode optical fiber;

10 an optical arrangement for directing said light from said multimode optical fiber onto said wavelength selective reflecting device, said directing arrangement configured such that a portion said directed light having said peak reflection wavelength is reflected from said wavelength selective reflecting device back along said first multimode optical fiber and back into said diode-lasers, thereby locking the wavelength
15 of the light emitted from said diode-lasers to said peak reflection wavelength; and

an optical arrangement for coupling a portion of said light from said multimode fiber light not reflected from said wavelength selective reflecting device into said cladding of said single-mode optical fiber.

19. A light source comprising:

a plurality of diode-lasers, each of said diode-lasers emitting light having a wavelength within an emitting bandwidth;

5 a plurality of optical fibers with the input ends of the fibers being in optical communication with individual ones of said diode lasers and the output ends thereof being fused to form a common output; and

a fiber optic collimator having an input end optically communicating with the common output from the optical fibers, said collimator including a grating configured to have a peak reflection wavelength within the emitting bandwidth of the diode-lasers
10 whereby a portion of the light entering the collimator is reflected back into the respective diode-lasers for locking the emitted wavelength thereof while the remainder of the light entering the collimator exits the collimator at an output end thereof.

20. A light source as recited in claim 19 wherein said grating has a bandwidth
15 less than about 1 nanometer and a reflectivity between about 0.5% and 50%.

21. A light source as recited in claim 20 utilized to pump a fiber laser.

22. A light source as recited in claim 20 utilized to pump a fiber amplifier.
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